

The Diagnosis of Lumbar Disc Degenerative Disease and Role of MRI: A Hospital Based Study

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ABSTRACT

Background: Degenerative Lumbar Disc (DLD) is widespread cause for lower back ache (LBA) Early diagnosis is most important in the treatment of DLD. Our study aimed to find out the role of MRI in the detection of degenerative disc diseases (DDD).

Materials and Methods: This study was conducted in the Department of Radiodiagnosis, S. P. Medical College, Bikaner, Rajasthan. A total of 50 patients were included in the study. The study population was subjected to MRI study. Images were collected and used for the analysis.

Results: In 50 patients, 34 showed DDD. Maximum patients showed annular disc bulge.

Conclusion: Our study evaluated and concluded that MRI plays major role in the detection of DDD.

Keywords: MRI, Lower Backache, Lumbar Disc, Disc Degeneration, Radiation.

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INTRODUCTION

Magnetic Resonance Imaging (MRI) is an important tool in the diagnosis of various DDD. Inflammatory DDD also can also be easily diagnosed with use of MRI. Signal intensity in intervertebral disc spaces and spine is used to diagnose disc degenerative disease.¹

Based on the review of literature DDD is more common in males compared to females. There are three important changes that have been identified. Bone marrow edema which appears hypointense on T1 and hyperintense on T2 (Type-I), Fatty replacement, which appears hyperintense on both T1 and T2 (Type-II) and bone sclerosis, which appears hypointense on both T1 and T2 (Type-III).²

Studies showed that disc degenerative disease (DDD) changes are associated with the various pathologies.³⁻⁵ MRI are able to detect DDD associated changes in the disc.⁶

This study was conducted to evaluate the role of MRI in the detection of lumbar disc degeneration.

MATERIALS AND METHODS

This study was conducted in the Department of Radiodiagnosis, S. P. Medical College, Bikaner, Rajasthan for a period of 1 year. R software used to calculate the sample size for this cross sectional study.⁷

50 patients were included in the study. Study protocol and procedure was explained in detail and informed consent was taken from each patient. Males and females both were included in the study.

Demographic changes and other information were recorded. Images were acquired in axial, coronal and sagittal planes. Slice thickness of 3 mm. All the images were subjected for the analysis.

Ethical Considerations

Approval was taken from institutional Ethics Committee.

Statistical Analysis

The data was expressed in number and percentage. Statistical Package for Social Sciences (SPSS 16.0) version used for analysis. Student t test applied to find the P values. P value less than 0.05 considered statistically significant at 95% confidence interval.

RESULTS

Among 50 cases, 34 showed the disc degenerative disease (DDD), of these 24 were males and 10 were females. Majority of the patients showed annular disc bulge (20) followed by protrusion (8), extrusion (4) and sequestration (2). Thus annular disc bulge was found to be the most common etiology of lower back ache (LBA) (Table-1, Figure-1 & 2).

Table 1: Distribution of Patients Based on Disk Herniation Type

Herniation type	L 1-L2	L 2-L3	L3-L4	L4-L5	L5-S1	Number
Annular disk bulge	1	3	5	10	1	20
Disc protrusion	1	1	1	3	2	8
Disc extrusion	0	0	1	2	1	4
Disc sequestration	0	0	0	2	0	2
Total	2	4	7	17	4	34



Fig 1: T2 weighted axial image at the L4-L5 level intervertebral disc showing right aracentral disc bulge indenting the anterior thecal sac



Fig 2: T2 weighted sagittal image showing disc dehydration with disc bulge and posterior annular tear at L4-L5 and L5- S1 level intervertebral discs

DISCUSSION

MR Imaging has major role in the diagnosis of DDD spine. Decreased signal intensity of the intervertebral disc image indicates disc dessication.^{8,9}

Spine Injury, physical damage, genetic factors and decreased intake of nutritional food play an important role in the pathology of DDD. Early diagnosis is important in the prevention of progression of DDD.¹⁰ Birney et.al study showed the role of MRI in the detection of DDD. They observed that L4-L5 degeneration was more common as compared to other levels. Our study also showed same results.¹¹ Grenier et.al study found MRI to be accurate in the diagnosis of minor degenerative changes in lumbar disc.¹² Our study also proved MRI as a specific, sensitive, and accurate imaging modality in detecting the lumbar disc degeneration.

CONCLUSION

Disc degeneration disease is the major cause for the low back. MRI is the imaging technique of choice for detection of disc degenerative disease (DDD).

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